

DECEMBER 1995

# HP Professional

**Improve Your  
Memory IQ**

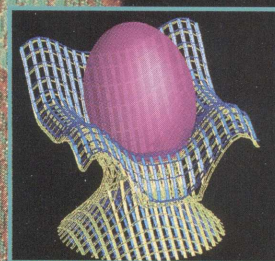
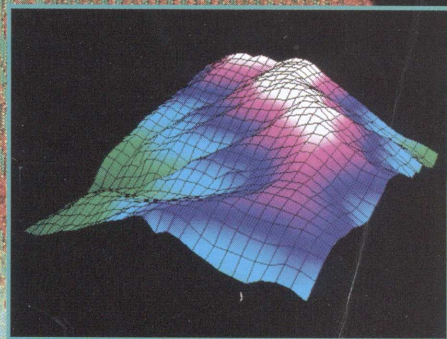
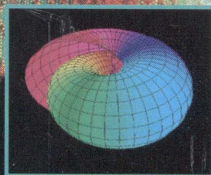
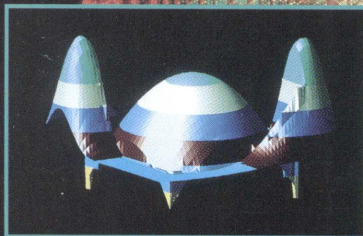
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**HP's Year-End  
Financials**

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## Workstation Update

**HP's  
Picture-Perfect  
Product Line**





2:24 PM

10,000-page run under way.

2:25 PM

Printer speaks to you in strange  
new language.

ER uppp ER uppp ER uppp ER up

2:26 PM

Call service supplier and try not to panic.

5:16 PM

Service guy finally arrives.

5:59 PM

Can't help, he says, it's a network thing.

6:00 PM

Panic. Visualize IBM printers to calm down.

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not catchall generalists. Specialists who can help  
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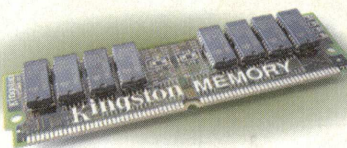




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December 1995

Vol. 9, No. 12

## HP Professional's Workstation Update

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By Marty Poniatowski

*Keeping up with the Joneses is nothing compared to keeping up with HP's workstation technology. Our annual update will get you ready for 1996 with in-depth coverage and analysis of the latest and greatest in workstations and X Stations from HP.*

## A Lifetime Of Memory

30

By Deborah Schwartz

*If only computer memory could last a lifetime. But noooo. You're stuck with replacing it at least once every year or two for the life of your system. Next year — it's 16 Mb more of the same. Our workstation memory roundup explains the dilemma and gives you the memory vendors with the DRAM to go.*

### COLUMNS

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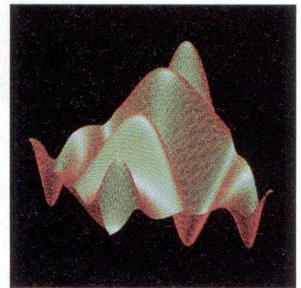
By Miles B. Kehoe

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# HP Professional

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to look at  
MiniSoft 92  
— the alternative.

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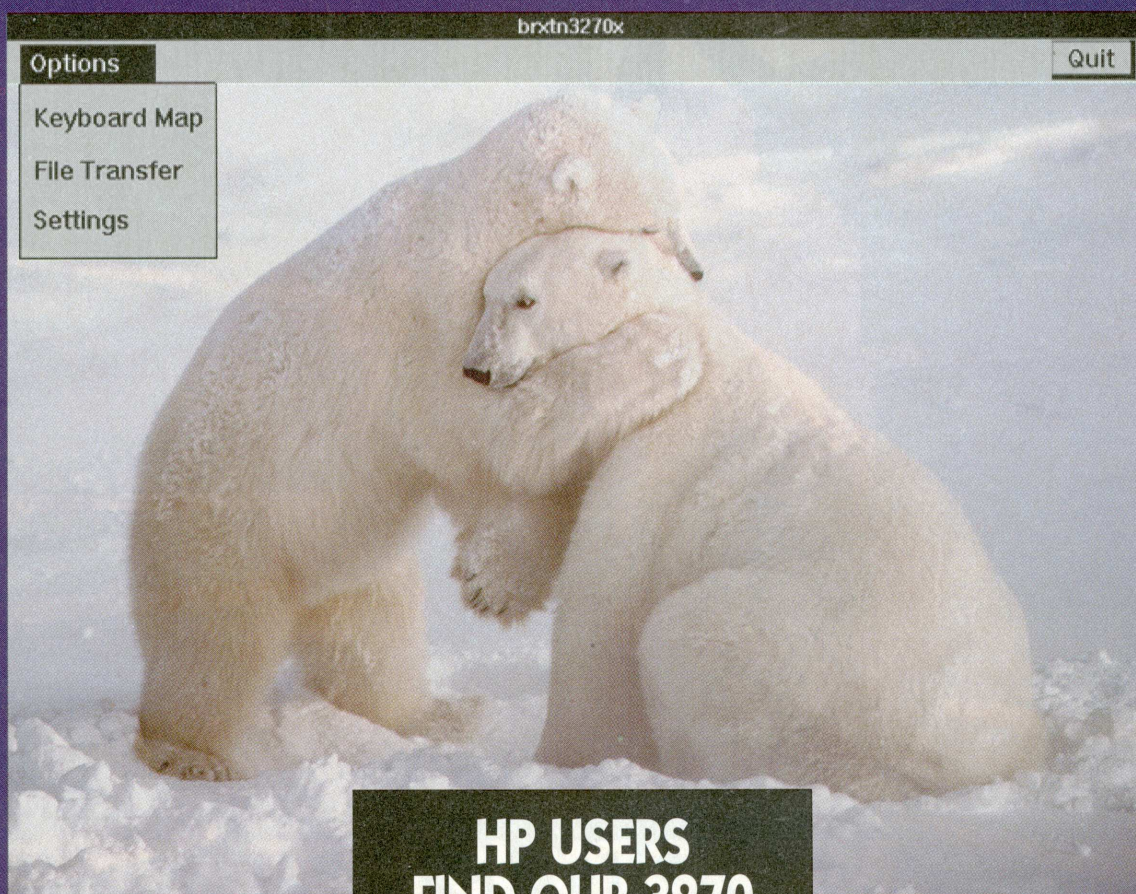
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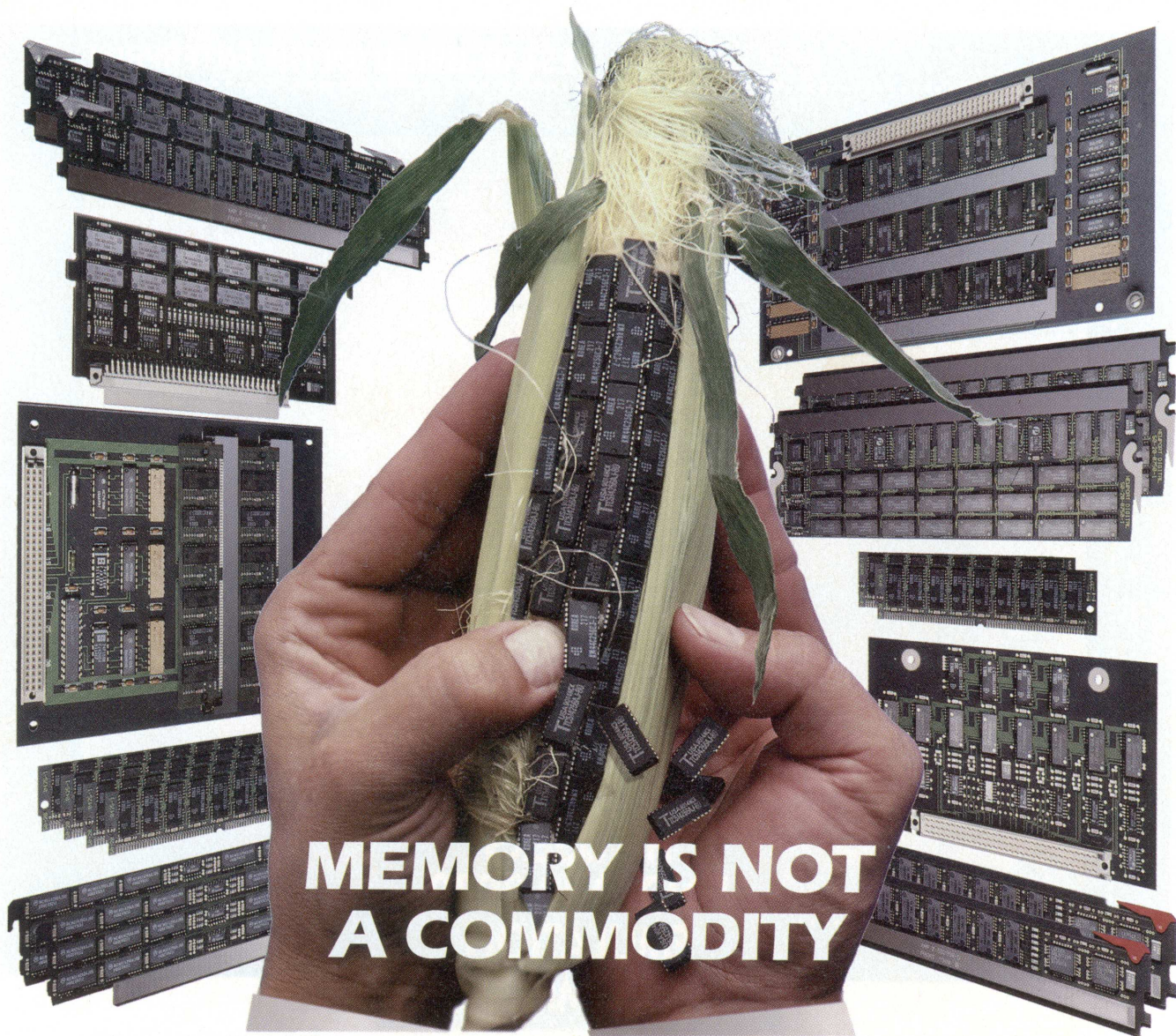
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CIRCLE 246 ON READER CARD



# Tabs For Tangalia And The Colo-Client-Serving Rat

I know a guy who knows a lady whose cousin knows a nurse who was in the hospital when a certain TV news anchor was rushed into the ER after a run-in with a Hab-A-Trail.... How about a friend of your aunt who knows a woman who smuggled a "little dog" from Mexico only to learn it was a South-of-the-Border sewer rat? By the way, could I have the tab off your beer can when you're done with it? Why? Well, each tab buys a minute of treatment on a dialysis machine for little baby Tangalia in Hoboken, New Jersey. You see, Tangalia's parents just can't afford the expense.

Urban legends. People around the world, young and old alike, thrive on perpetuating folklore and tall tales. Most recently, for example, L.A. gang members were going to shoot anyone who flashed their headlights at them. It seems the more horrific and grotesque or far-fetched the tale, the more we want to believe it and the faster we want to propagate it.

The computer industry is not without its own version of urban legends. Did you hear the one about reefer growing rampant on HP's ball fields? Or perhaps you've heard Bill Gates bought the Catholic Church awhile back. Then there are the timeless classics: client-server computing and open systems. How many nights have young wide-eyed execs sat around the cappuccino machine listening to the legend of multivendor platforms working together harmoniously? It's about as enticing as the tale of the IS director who picks up a hitchhiking COBOL programmer. On the way, the programmer borrows the IS manager's palmtop computer to check on some old code on a client-server network he developed somewhere. After he reaches his destination, the IS manager realizes the programmer still has his palmtop. But when he goes looking to find him, he discovers the mysterious programmer died several years ago on that exact date in a corporate downsizing. Yet he spies his palmtop on the programmer's desk across the room.

Even the HP market isn't at a lack for legends. How about Windows NT on the HP 9000 next month; or the HP 3000 is a growing "open-proprietary" system. We've all heard wives tales of "huge" corporations somewhere in the world purchasing millions of HP 3000s, but their names cannot be revealed because they are afraid that their competitors will get wind of their great secret computing advantage (of which no one else is aware). But my all time favorite myth has got to be that *HP Professional* is an HP 3000 magazine.

This past year *HP Professional* has emerged as the definitive HP multiplatform publication covering HP 9000 systems and HP-UX, as well as PC networking and other internetworking and interoperability issues. Our 1995 highlights include a three-part series on HP-UX 10. It's the most popular series we've published, with reprint requests from HP user groups worldwide.

Our articles on HP workstations, HP OpenView, PC-to-UNIX integration and HP 3000-to-UNIX integration were our most widely read and appreciated features during 1995. We added new columns including Network Management and Networking PCs. We also welcome two new members to the HP Professional Editorial Advisory Board — Robert Bruen, Computer Facilities Manager for the Lab for Nuclear Science at the Massachusetts Institute of Technology (MIT), and Thomas Kucharvy, President of Summit Strategies, an analyst group.

Finally, there is one enduring myth that insists on rearing its ugly head every year: "HP can't continue like it is!" Well, check out HP's year-end financials in this month's Industry Watch. Guess what? The Legend lives on.



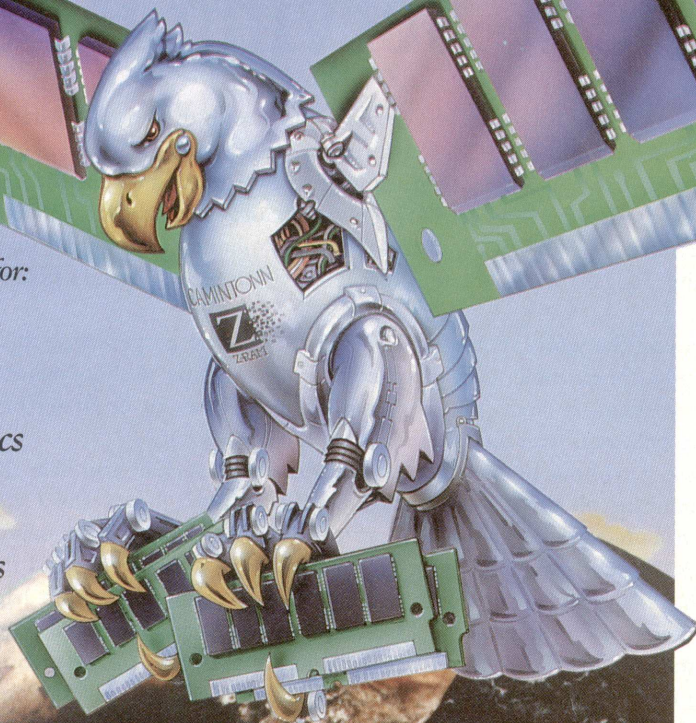
By Charlie Simpson

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**CIRCLE 294 ON READER CARD**



## INDUSTRY WATCH

George A. Thompson

## AT PRESS

## HP REPORTS DOUBLE DIGIT GROWTH

Although HP rang in its fiscal New Year on October 31, on November 17, HP reported a 29 percent growth in revenue, a 27 percent increase in orders and an impressive 42 percent growth in net earnings in their fourth quarter. That amounted to 31.5 billion reasons to celebrate as the company reported \$31.5 billion in revenue for fiscal 1995, an overall 26 percent increase over last year. Net revenue from outside the United States was \$17.5 billion, with orders increasing 31 percent. HP continued its double digit growth with net revenue increases across all business segments: computer products, service and support in addition to electronics test measurement instrumentation showed the greatest increase at 29 and 21 percent, respectively.

However, because of lower gross profit margins in HP's fourth quarter, Wall Street was cautious. Stock analysts expect that pressure on HP's profit margins, which are already "razor thin," will only get worse next year. In fact, the day after the last quarter's numbers went public, the price of HP stock was off by \$4.75 for the day, and \$3.25 from its \$91.75 high for the year. In a related move, HP's board of directors also authorized the repurchase of \$1 billion in common stock. Since 1983, HP's board has authorized a total of \$4.8 billion in stock repurchases.

## PUTTING ON THE RISC

On October 9, the PA-7300LC CPU was introduced. According to Larry Inman, manager of HP's Advanced Technology Marketing for CSO, it's the first PA-RISC CPU to integrate an on-chip (Level 1) cache (virtually indexed 64 KB instruction and 64 KB data caches). With 9.2 million transistors contained in a 464-pin CPGA package, the PA-7300LC two-way superscalar design is based on the PA-7100LC and supports HP's PA 1.1 32-bit architecture. Like the PA-7100LC, the PA-7300LC also includes MPEG-1 decoding for multimedia and graphics applications.

An optional off-chip (Level 2) cache is capable of real mode, write-through updates. Configurations 512 KB to 8 MB supports commodity SRAM. The 128-bit datapath is able to simultaneously handle integer/integer or integer/floating-point instruction pairs. According to Inman, the PA-7300LC, (like its predecessor the PA-7100LC) will be used in entry-level servers (for corporate workgroup applications) and low to midrange workstations, especially where multimedia-intensive

applications are being developed. Mark your calendars for shipments of such systems beginning in the third quarter of 1996. ●

## PUTTING ON THE RISC II

On November 2, HP began shipping the PA-8000, its first full 64-bit CPU to its Precision RISC Organizations (PRO) partners. Founded in March 1992, HP's PRO partners include Hitachi Ltd., Oki Electric Industry Co., Convex Computer Corp., ComputerVision, Oracle Corp., Rational Software Corp. Stratus Computer Inc., Winbond Electronics Corp. and Yokogawa Electric Corp.

Fabricated using .5 micron, 3.3V CMOS processes, the PA-8000's SPECint95 benchmark numbers are 43 percent higher than IBM's PowerPC 604; 69 percent higher than Sun's UltraSPARC; 18 percent higher than DEC's 21164 Alpha; and 16 percent higher than MIPS R10000. According to HP estimates, SPECfp95 benchmark numbers are 200 percent higher than the PowerPC, 103 percent higher than UltraSPARC and 29 percent higher

than Alpha. SPECfp95 numbers were the same for the PA-8000 and the MIPS R10000. First announced this past March, the PA-8000 CPU is scheduled to begin appearing in HP systems in the first quarter of 1996. ●

## HP TAKES UP THE PEN WITH OMNIGO

On November 1, HP's Personal Information Systems Division got into the act by introducing the HP OmniGo 100 (\$350), a 12 ounce handheld organizer. Touted at this August's Interex by Lew Platt, HP's CEO and president, as an information appliance, the OmniGo uses the GEOS OS from GeoWorks (Alameda, Calif.) software and is the first HP product to take advantage of a stylus (or pen) for navigation, data capture and input by a user. A "jotter" app allows users to capture small pieces of information, and a "notepad" app allows for input of notes. Graffiti (developed by Palm Computing and Bokja Software) is a handwriting recognition system.

The OmniGo's front cover, with a 360-degree hinge, folds back revealing the screen or a keyboard. The OminGo includes 1 MB RAM, 3 MB ROM, a Type II (PCMCIA) PC Card slot and a serial port. It uses two AA batteries. Designed as a personal information management tool, the OmniGo includes an HP12C financial calculator, HP financial-analysis and spreadsheet tools, as well as appointment, calendar, address and telephone book among other features. Intuit's Pocket Quicken is bundled free to all new purchasers. Other currently available solutions include HP's OmniGo Connectivity Pack and the HP OmniGo 100 Clip & Go. Available through retail and mass merchant channels like Service Merchandise, OfficeMax and Staples,



as well as home-office and PC/peripheral channels. ●

## OH NO, OMNI-NO-GO

No sooner had the OmniGo gotten out on the retailer's shelves, HP needed to recall some of the units because of a manufacturing defect that created a possible loss of information when the AA batteries were changed. According to HP, the problem was isolated in about 1,900 units in the United States. And only 500 initial customers were believed to be affected. ●

## BATTLE OF THE NETWORKED STARS

At Comdex in Las Vegas, HP and Starlight Networks (Mountain View, Calif.) announced a joint worldwide alliance that bundles Starlight's StarWare 2.0 networking multimedia software on HP's Intel-based NetServers (LH Series: 5/75 LH, 5/100 LH and 5/100 LH2). Installed as a NetWare Loadable Module (NLM) using the 3.12 or 4.10 version of Novell's OS, StarWare (not yet a certified Novell product) can support up to 100 concurrent 1.5 Mbps video streams. Multimedia formats supported include MPEG-1, MPEG-2, Video for Windows, Indeo, PLV, Motion JPEG and QuickTime. Client platforms include PCs and Macs. Networks supported include 10BaseT, 100VGAnyLAN, FDDI, ATM and Token Ring networks.

"It's a litmus test of the viability of video distribution over LANs," according to Jim Greene, analyst for Summit Strategies (Boston, Mass.). Microsoft's Tiger and Oracle's VideoServer will be *eventual competitors* predicts Greene, but for now the HP/Starlight combination is unchallenged. Although claiming that the solution is scalable up to HP 9000 systems, it remains to be seen because that will not be available until sometime in 1996 when Starlight's UNIX-based StarWorks product is ported to the HP-UX platform. In the meantime, the Intel solution will be available from HP direct and indirect channels and

sold for information-on-demand, performance support and video training applications in the financial services, telecommunications and retail markets.

Unlike HP's own MPower and InSoft's Communique! (another HP alliance), which are UNIX-based video conferencing solutions, the Starlight bundle is a video streaming technology. "They distribute information differently," explains Greene.

Available this month, preconfigured StarWare 2.0 on HP Netserver supporting 50 concurrent users (75 Mbps) and storing 20 hours of MPEG-1 video (\$28,000). Price for StarWare 2.0 software is \$4,995 for 10 users; \$9,995 for 25; \$17,995 for 50; and \$34,995 for 100. ●

## HOW DID THEY DO THAT?

That's the question some may be asking after HP's introduction of 13 new HP 3000 servers during the first week in November. Nine new servers — the 996 Series of Corporate Business Servers — replace the HP 3000/991 and eight 995 models. And four new

servers — the 969KS Series — were added to an existing five systems, the 959KS Series. According to David Snow, HP 3000 product manager, all the new HP 3000 systems are providing improved performance at a reduced price.

For example, the Series 996, using a 120MHz PA-7150 CPU, provides a 15 percent application performance increase for the same price as the 995, it replaces. The new Series 969KS systems, using a PA-7200 CPU, provides a 20 percent application performance over the Series 959KS.

Additional highlights include:

- Bundled CD-ROM drives with all HP 3000 systems
- Field upgrades beginning December 1, 1995
- Doubling of memory capacity for Series 996 in the second quarter of 1996
- A 64-user license for Series 996
- 8, 20, 32 and 40 user licenses for the 9x8 and 9x9KS systems
- Increased disk capacity (448 GB) for 9x9KS systems ●

## THREE'S COMPANY

Summit Strategies believes that HP has the potential of winning the most [from the Novell-SCO-HP alliance announced in

September]. The new agreements are the next critical steps, providing vehicles for making HP-UX the leading implementation of UNIX on

the leading chip architecture. While HP's systems group can continue to focus its efforts at the high end of the market, it plans to use: NetWare Directory Services (NDS)/DCE integration and the gradual porting of other NetWare services to establish HP-UX as a viable file-print server OS and, most importantly, the preferred application server within

NetWare environments; SCO's distribution channel to establish HP-UX as the de facto UNIX standard among VARs, in small and mid-sized businesses and in departments and branches of larger accounts; this channel and market base combined with HP's position at the high end of the market, to attract a large base of compelling software to HP-UX; SCO's system-vendor neutrality to attract a large number of software OEMs; and these VAR and OEM channels as vehicles for expanding the markets for selected HP middleware and hardware and potentially for establishing them as standards. [Of course,] Microsoft's Windows NT Server operating system is the primary target of the new UNIX alliance [which is] intended to build a strong off-the-shelf application base and channel presence for UNIX and a broad market competitor to NT Server. — excerpted from SummitVision, October 1995, Summit Strategies (Boston, Mass.).





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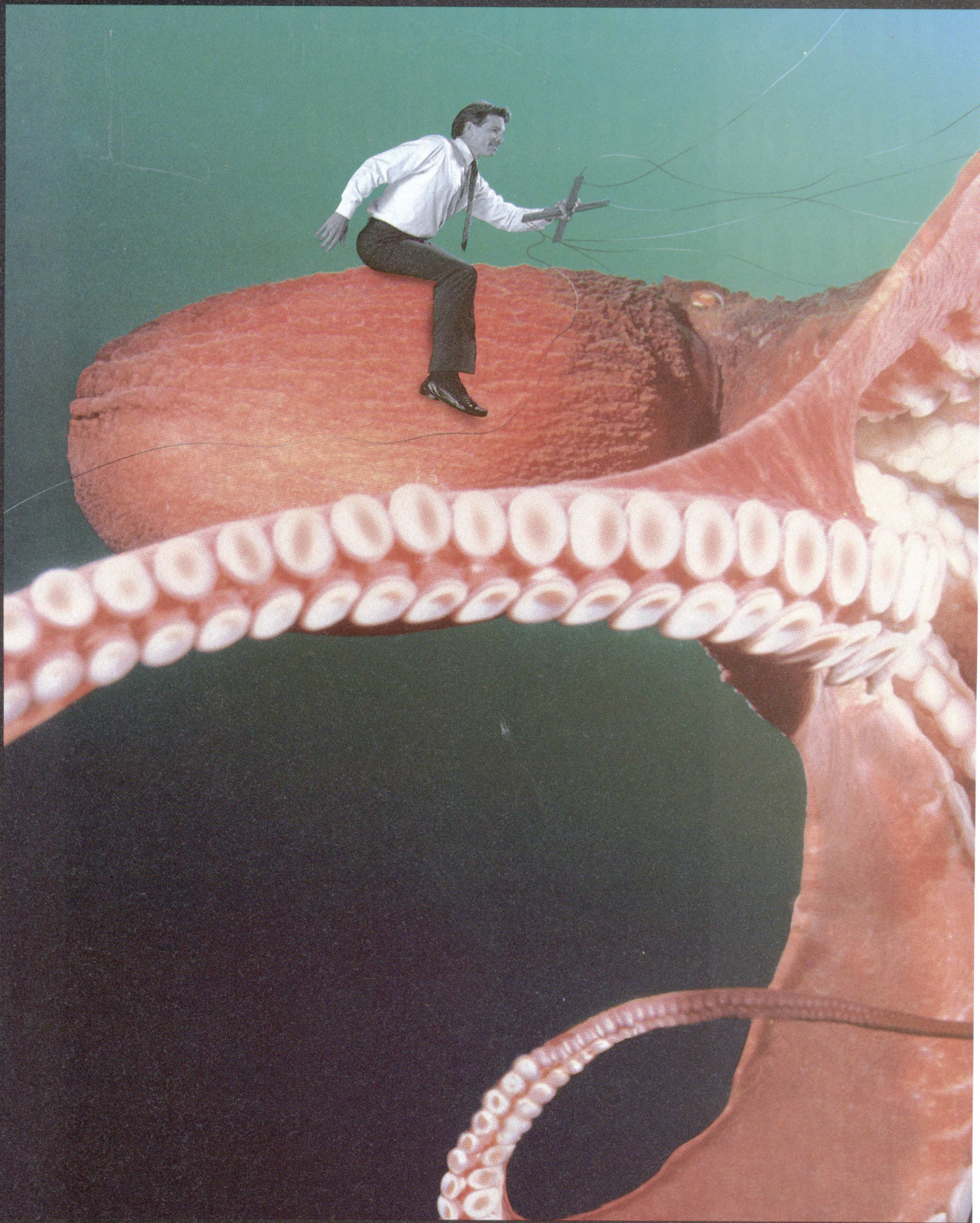


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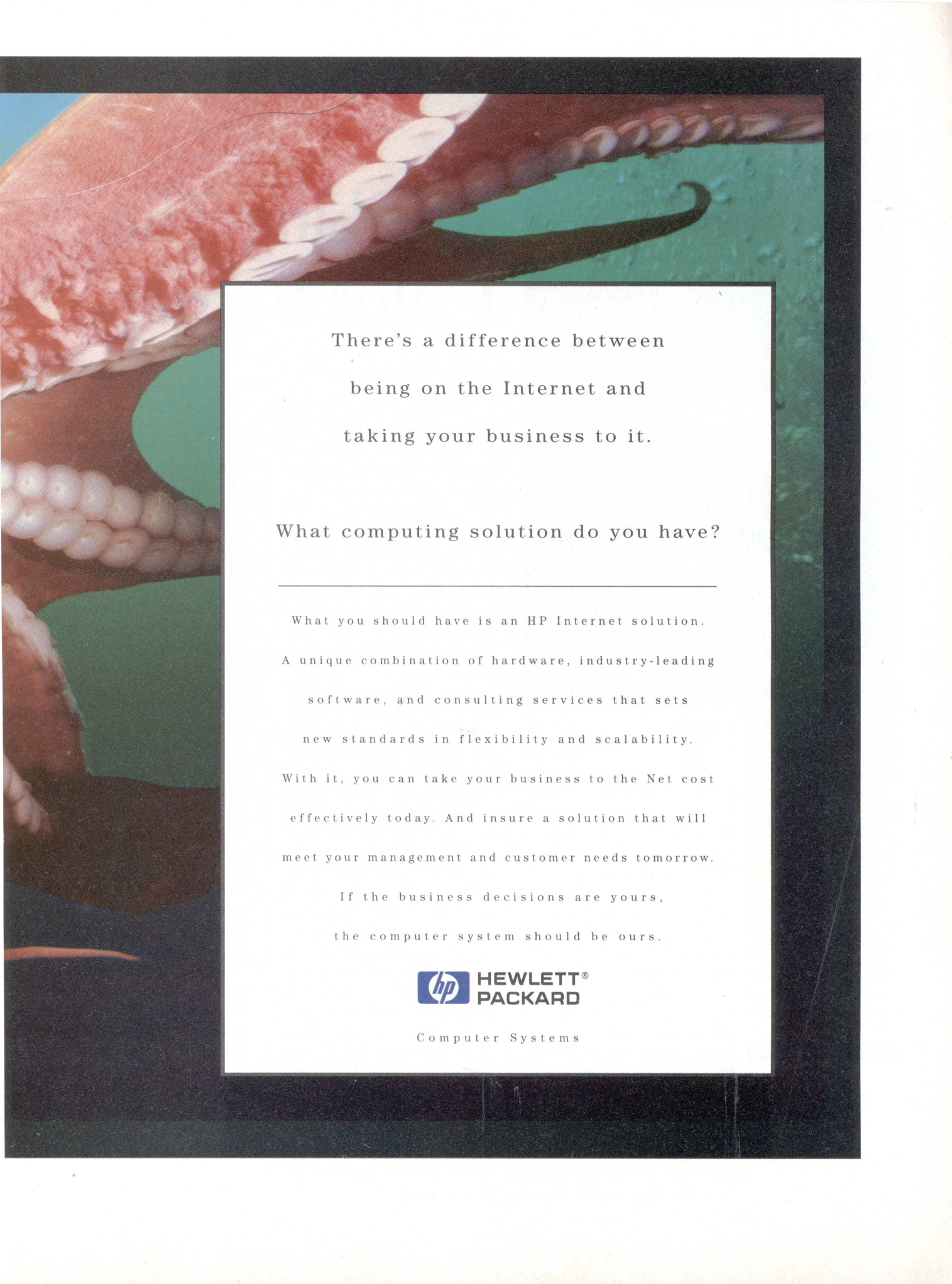




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Computer Systems





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- Supports software programs for Macintosh, PC and UNIX computers
- Price is \$4,995

#### **Tektronix Inc.**

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tel: (503) 682-7377  
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CIRCLE 353 ON READER CARD

**T**he difficulty in adopting the use of color printers in an office environment isn't because the technology isn't there, but because the price is unreachable," explains Rod Belshee, manager of product marketing at Tektronix Inc. (Wilsonville, Ore.).

Tektronix, with the introduction of its Phaser 340 desktop color printer, has made a move to break the cost barrier and move color printing into mainstream corporate environments. According to Belshee the target user is involved in corporate and executive departments who rely on presentation materials. "The Phaser 340 satisfies the need to communicate information-rich data, like spreadsheets, charts,

# Breaking The Color Barrier

graphs, production schedules — in color."

Other applications include short-run printing projects such as brochures and newsletters. Similar to high-speed commercial printing techniques, the 340's offset drum architecture uses an image transfer drum to transfer the document page to paper (including transparency film) in one step. The results are crisp, sharp edges with no color bleeding or fuzzy text, combined with a four page per minute speed.

Fred Rogers, media communications manager for Universal Weather and Aviation (Houston, Texas), is responsible for managing the advertising and public relations operations for the company. "I use the Phaser 340 regularly to produce presentation materials, an international newsletter, displays signs, handouts, overhead materials, portable sales guide reference sheets and company fliers," explains Rogers. He works in a workgroup environment where two other designers also print to the 340.

In addition to the offset drum architecture, use of solid-ink sticks called ColorStix eliminate much of the maintenance required with toner cartridges for laser printers or liquid-ink for inkjet printers. Each ColorStix produces approximately 1,000 prints.

"Color printer users are extremely sensitive to cost. The cost of the unit and cost per page," explains Belshee. "Because we were familiar with these technologies [solid ink, laser printers and offset drum architectures], we had a small learning curve in developing the Phaser 340. We took the best of these technologies to create an affordable color printer." List price is \$4,995 and average cost is 11 cents per page.

Belshee believes color printing will continue to grow in the future by means of electronic distribution. "As more people are getting information from across the country through the Internet, they are going to want to print it out in color," projects Belshee.

The Phaser 340, which can be shared across a range of computing platforms and workgroup configurations, can be used in environments ranging from three or four to 20 to 30 users. The Phaser 340 supports most software programs for Macintosh, PC and UNIX computers. Memory buffers and RAM configuration can be expanded for faster image processing. The PhaserShare Ethernet card supports Novell, NetWare, EtherTalk and TCP/IP protocols.

*Andrea Zavod  
Contributing Author*



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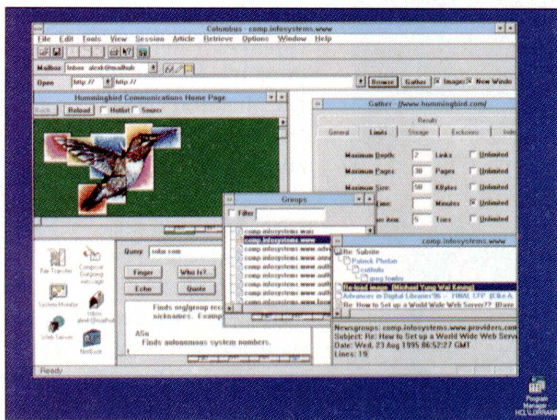
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CIRCLE 211 ON READER CARD



# In 1995, Columbus Brought The "Intranet" Alive



## COLUMBUS

- Includes a WinSock-compliant VxD TCP/IP stack
- Supports multiple users via encrypted login
- Available for Microsoft Windows 3.x.

### Hummingbird Communications Ltd.

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tel: (416) 496-2200  
fax: (416) 496-2207

CIRCLE 352 ON READER CARD

Everyone's talking about the Internet these days. But what about the Intranet? The what? The Intranet. It's an internal corporate information system and Hummingbird Communications Ltd.'s (North York, Ontario) Columbus is the product that can help your company stay connected.

Columbus is a highly functional, seamlessly integrated Microsoft Windows-based Internet application that is designed to provide access to the Internet and enterprise Intranets. According to Peter Audiore, director of marketing at Hummingbird, this product is positioning itself in a new market. "Columbus is more than a primal browser," Audiore says, "Products like Columbus are helping users approach a universal desktop.

It [computing] is at the point where it doesn't matter where information or applications are anymore."

Columbus simplifies Internet and Intranet navigation by seamlessly integrating a wide range of protocols and Internet tools including: a Web browser with gopher capabilities; a Web server that enables casual Web document distribution and sharing; an E-mail application with POP3, SMTP and MIME support; a WinSock-compliant VxD TCP/IP stack; an integrated ftp application with easy drag-and-drop file transfer of text and binary files; an integrated telnet client which supports VT52 to VT320 terminal emulations; news reader clients which provide access to Usenet newsgroups; a gather facility; an activity manager and systems monitor utility that enables the PC user to manage and monitor multiple simultaneous activities, and to display network activity; an activity scheduler which facilitates efficient network usage with unattended operation in off-peak hours; an integrated system monitor; and the multifunction NetBook application which stores URL hot lists, E-mail addresses, and names and location of host servers such as Web servers, ftp servers and gopher servers.

Columbus supports multiple users via encrypted login, and enhanced security features enable system administrators to control Internet/Intranet access by controlling application access and usage.

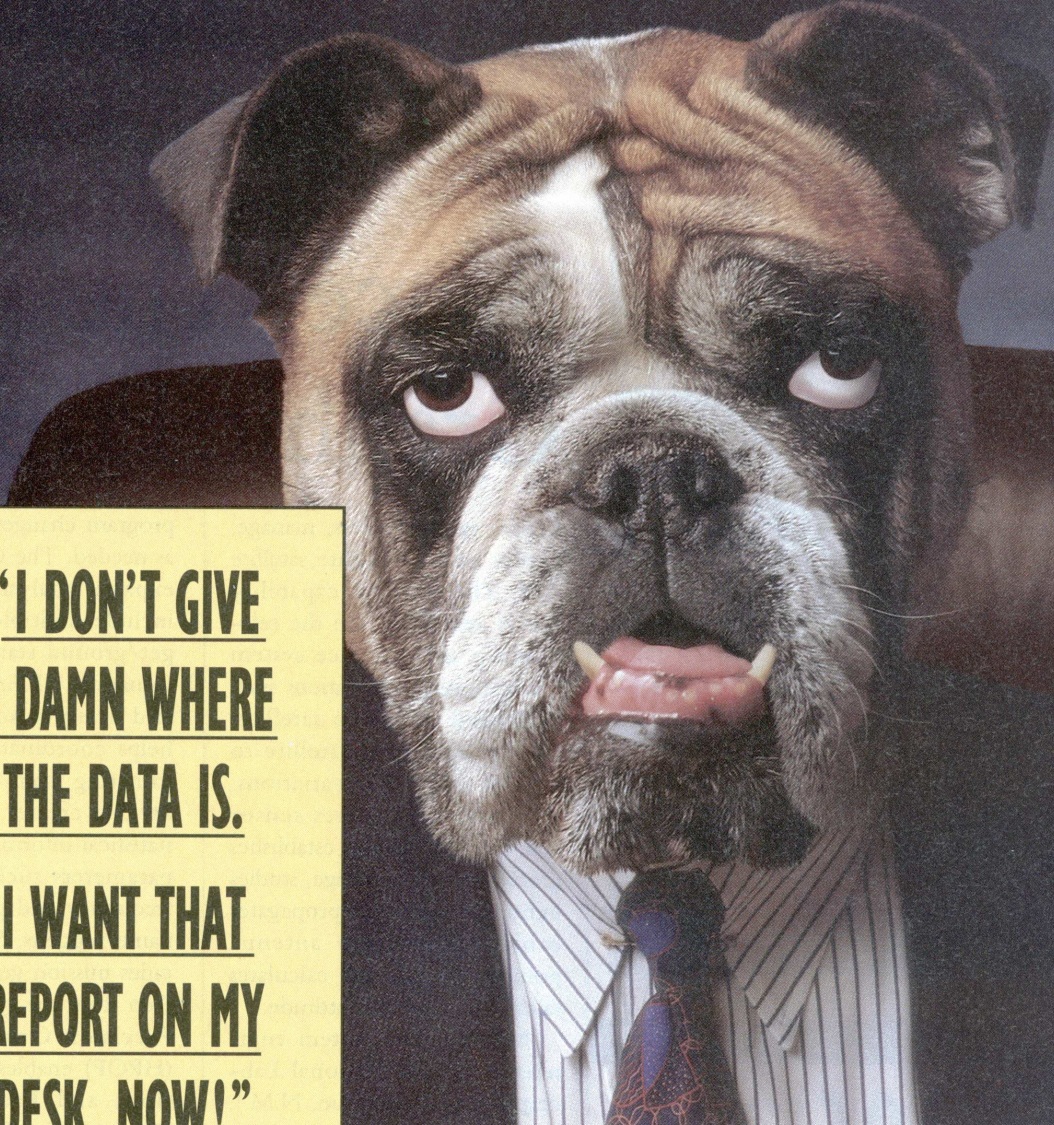
Additionally, Columbus includes an Internet search utility, and electronic document software for advanced document authoring, management and distribution, enabling legacy documentation to be easily converted to a portable document format for enterprisewide distribution and collaborative documentation development.

Columbus is a multithreaded Windows application designed to enable multiple simultaneous execution of various functions with the highest possible performance. Columbus features innovative gathering and scheduling facilities that enable users to capture entire HTML files and linked documents in original HTML source or plain text format, and the ability to schedule and monitor all application activities.

Columbus is available for Microsoft Windows 3.x. Windows NT and Windows 95 versions will be available by the end of 1995.

—Deborah Schwartz,  
Assistant Editor





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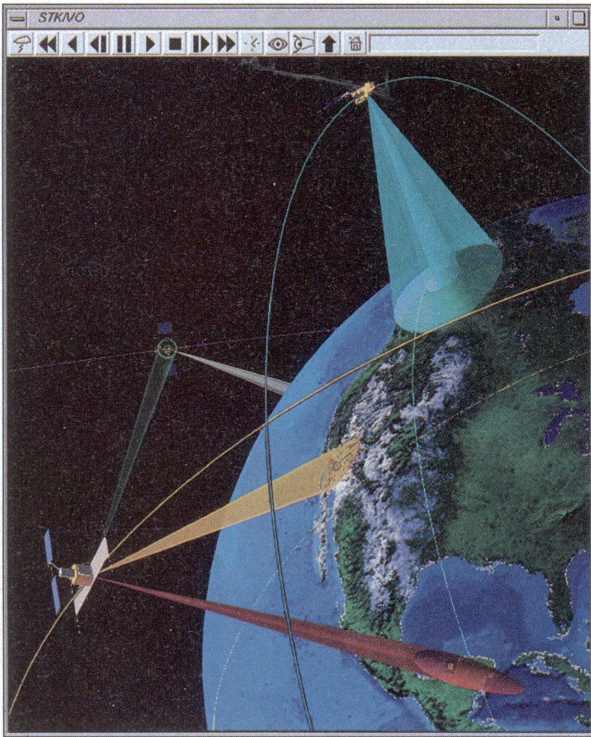
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**CIRCLE 247 ON READER CARD**





### SATELLITE TOOL KIT

- Translates numerical data into functional graphics
- Available on HP 9000 workstations
- Data output is in ASCII, graphics output is in PostScript or Encapsulated Postscript

#### Analytical Graphics Inc.

P.O. Box 61206  
King of Prussia, PA 19406  
tel: (800) 220-4STK  
fax: (610) 337-3058

CIRCLE 355 ON READER CARD

**W**ithout graphical tools to create intuitive and effective ways to display data, you may have had to resort to pencils of different lengths to visualize comparative or relational data. For aerospace industry analysts, gone are the days of hand tricks with "orange" earths and paper-cone orbits. Analytical Graphics (AG; King of Prussia, Pa.) has designed a satellite system planning and analysis tool, Satellite Tool Kit (STK). It incorporates advanced 3D model and presentation graphics to help translate numerical data into functional graphics.

STK is an interactive, graphical software package that helps decision-makers, analysts, developers, operators and users of

# Space, The Graphic Frontier

satellite systems access, manage, display and manipulate satellite data. The graphics capability allows analysts to see the relationship among space system activities and interrelations such as ground station to satellite, satellite to target, satellite to satellite and other variations. STK also determines sensor coverage and swath, establishes ground station coverage, studies lighting conditions, propagates orbits, determines antenna pointing angles, and calculates satellite position and attitude.

Max Decker, system engineer at Sandia National Laboratories (Albuquerque, N.M.), says "We use Satellite Tool Kit in system analysis during the design phase. We need to determine how much power our system needs to gather science data as a satellite passes a ground station. We use STK to determine access times and antenna angles from the satellite to the ground station."

Additional modules offer flexibility and expanded functionality for analysts as well as non-scientific decision makers. For example, STK Visualization Option (STK/VO) enhances the core graphics capabilities with a 3D graphical interface.

STK Programmer's Library provides programmers with access to 200,000 lines of code and 450 subroutines in C, Ada and FORTRAN from which

program changes can be made as needed. The Chains module expands analysis functions to include multiple satellite/target/ground station relational scenarios. GREAS is an event and activity scheduler that helps coordinate information gathering from multiple satellites. It creates graphical and statistical information based on parameters such as duration, frequency and priority. As its name suggests, Space Vu provides mission geometry data as seen from the spacecraft. High Precision Orbit Propagator (HPOP) enables orbit generation, and Precision Orbit Determination System (PODS) determines spacecraft orbits based on data from ground- and space-based sensors.

STK is installed in commercial and government organizations where common applications include communications, Earth resources, intelligence, navigation, space exploration and weather. It is available on HP 9000 workstations with the E&S Freedom Series graphics accelerators. All data output is in ASCII, graphics output is in PostScript or Encapsulated Postscript. It is X Windows compatible, including Open Windows.

—Andrea Zavod,  
Contributing Author

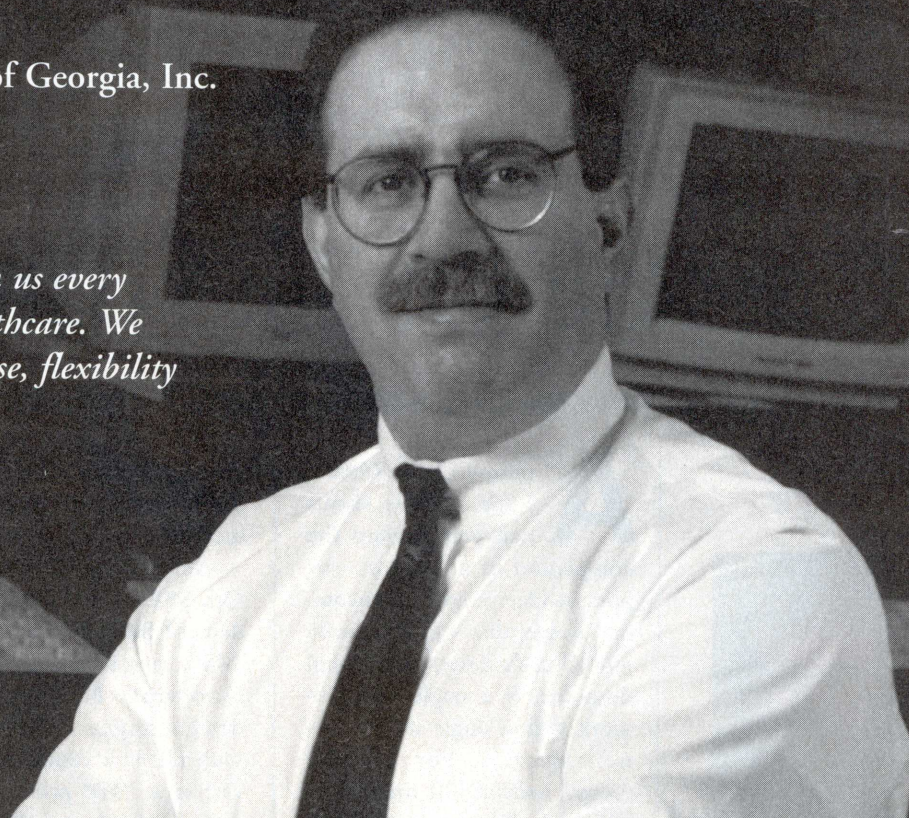


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*Senior Systems Analyst*

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# Get Rid Of The Batch

SAP America Inc. Proves Their R/3 Business Modules Interface And Integrate With the Best Of Them



"HP provided SAP with hardware and the technical know-how to explore how our comprehensive business solution could operate on a workstation in an open systems environment."

Alexander Ott  
Vice President  
of Strategic Partnerships  
SAP America Inc.

## SAP America Inc.

710 Lee Rd., Ste. 200  
Wayne, PA 19087  
tel: (610) 725-4500  
fax: (610) 725-4910

CIRCLE 351 ON READER CARD

Andrew Corp. (Orland Park, Ill.) is about half-way toward the completion of a massive, corporatewide systems restructuring project that will eventually link all its facilities, foreign and domestic, in a single data network with a single set of business systems. For Andrew Corp., with \$800 million in sales and offices in Europe and Asia, that is no small task.

Andrew's solution, according to Ed Nield, Andrew's vice president of MIS, is client-server computing based on the HP 9000 platform, an Oracle database and the R/3 set of business applications from SAP America (Wayne, Pa.). "SAP is true client-server," says Nield. "One of our decision drivers at the outset was to get on to an open systems, client-server platform.

"We bought it to run the entire enterprise on one set of software. Our view of life is that people throughout the Andrew world can use one common set of core business systems to share information," Nield says."

Andrew was one of SAP's early customers, purchasing the R/3 product in 1993. Headquartered in Walldorf, Germany, SAP's North American sales have soared from \$50 million in 1992, when the R/3 product was launched, to \$367 million at the end of last year. In 1994, SAP was the

first application software vendor to reach over \$1 billion in worldwide sales.

According to Alexander Ott, SAP America's vice president of Strategic Partnerships, SAP's ties to HP have been close since R/3 was in the design stages. "We worked with HP in a variety of areas," Ott says, "HP provided SAP with hardware and the technical know-how to explore how our comprehensive business solution could operate on a workstation in an open systems environment."

Today, SAP is a platform partner, technology partner and logo partner with HP, and works with HP's Professional Services Organization consultants implementing R/3.

"We have a close relationship with HP in a variety of industries, predominantly in the process control industry, health care and high tech. It's no secret that HP now has the largest market share in the SAP R/3 environment," Ott says.

At Andrew, Nield sees no apparent obstacles to achieving their original plans. According to those plans, the company's systems are defined as a Novell distributed topology with many LANs around the world with R/3 running on top of them.

Nield describes R/3 as a shell surrounding a database with applications written against the database. "R/3

handles the interfaces to the database, which in our case is Oracle. SAP's client-server involves three pieces of computing: a presentation level which is on a LAN-based system, and a series of application servers surrounding a big database server," he says.


"So far, the software has been very stable for us," Nield continues. "R/3 includes a full set of business modules, financials, manufacturing, order entry, etc., that are fully integrated with each other. This means that information on one system is instantly available to the others — there isn't a batch process in between.

According to Nield, the only difficulties encountered in getting the system installed have not been a result of the software, rather a result of internal changes at Andrew Corp. that the restructuring has required.

"The software has functionality built into it that we're trying to use native — as it is. Because of the way the software functions, we've had to go back and look at our own internal processes and change some of those. There can be resistance, but we find it has been a good thing to do. The end result is better"

—Sam Dickey  
Contributing Author





# WHICH UNIX SYSTEMS MANAGEMENT VENDOR HAS MORE THAN 4,000 COMPANIES APPLAUDING IN UNISON?

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Plus, Unison's software products have a fault-tolerant architecture that allows companies to safely automate the management of their business-critical applications. And Unison's products are fully integrated with the leading management frameworks, such as HP's OpenView and IBM's NetView, permitting customers to leverage their investments in those frameworks.

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CIRCLE 139 ON READER CARD



## Workstation

## UPdate

Marty Poniatowski

The vast amount  
of money HP  
invests in R&D results

in, among other things, many  
new workstation-related products. This is a lot to  
keep up with. This includes new workstations,  
graphics, X stations, operating system upgrades,  
PC integration products and others. Although  
some of these areas may interest you more than  
others, this article gives a snapshot of what exists  
today in the HP workstation family. There is  
certainly more to keep up with than ever before,  
and it's helpful to be aware of the breadth of  
what is available to you from HP.

**T**he focus of the workstation product line is, well, workstations. It is easy to lose sight of this when a major announcement or war takes place in an area such as graphics. You might think at that point in time that graphics is all anyone cares about. However, because workstation

advancements take place on a regular basis, you can expect new models to come into the product line and old ones to go. Figure 1 shows the workstation family as it exists as of this writing. Also included are SPECint92 (top) and SPECfp92 (bottom) numbers in Figure 1 which show the performance of the systems running HP-UX 10.01. Keep in mind this is the workstation family only; there is a complete server family as well. So look for a "Server Update" article early next year in *HP Professional*.

The most significant change to the workstation

family is the addition of the J200 and J210, and the C100 and C110. These systems support one or two processors using HP's latest processor, the PA-7200. The performance numbers shown are for two processor systems. Both the J200 and J210 have five expansion slots (EISA and GSC).

The entry level systems shown in the diagram are the 712s. These are based on the PA-7100LC processor, which has built-in multimedia capability such as decoding full motion MPEG-1 digital video at 30 frames per second (fps). The 715s also use the PA-7100LC and can



# IMAGE/SQL objects that you can adapt and manage with Adager

**DATAENTRIES** hold information about *entities* (such as employees) or *relationships* (such as project assignments). ► **Relocate (Repack)** all of the entries in a dataset to untangle their chains, to optimize your on-line access via paths. Optimize any detail path, whether it is a Primary Path or not. Adager automatically updates all the necessary structures, including Third-Party-Indexing (TPI). ► **Erase** all of the entries of a dataset (this is impressively fast for details that are linked to many masters). ■

**FIELDS** hold the attributes and keys of entries. **ITEMS** are templates that define the characteristics of fields. ► **Shuffle** the order of fields and items. ► **Add** and **delete** fields and items and **change their definitions** (from J2 integers to IEEE reals, or from 2X10 to 4X8, for example). Adager automatically **reformats** all of your data and, if necessary, **rehashes** those master datasets

whose search fields were involved. ► You may choose to **redefine** non-search fields *without* reformatting data. ► **Rename** fields and items. ■

**CHAINS** are groups of *detail* entries with a common search-field value. Chains are also groups of *master synonym* entries that share a common primary address. **PATHS** are performance boosters for quick access to detail entries with the same search-field value. ► **Add** and **delete** paths. ► **Add** and **delete** a path's sort feature. ► **Examine, diagnose** and **fix** all of the chains in a path or just individual chains or specific entries. (Thanks to the robustness of IMAGE/SQL, you will rarely need to fix things up—but it's nice to have the powerful Adager tools handy!) ■

**DATASETS** are collections of entries. ► **Add** datasets and **delete** datasets. ► **Shuffle** the order of datasets. ► **Replace**, with new empty structures,

datasets that you may have lost or damaged. ► **Erase** all of the entries of a dataset.

► **Change the type of a dataset** (from manual, automatic, or detail, to any other type). ► **Examine, diagnose** and **fix** datasets. ► **Move** datasets from one disc location to another. ► **Reblock** datasets to optimize disc usage. ► **Rename** datasets. ► **Change the Capacities** of datasets, including DYNAMIC DETAIL DATASET EXPANSION (DDX). ► **Manage DATASETS WHICH ARE LARGER THAN FOUR GIGABYTES.** ■

**DATABASES** are collections of datasets. ► **Copy** or **Rename** databases and their associated structures, including THIRD-PARTY-INDEXING (TPI). ► **Generate** a definition—schema—of a database's structure. ► **Manage** security provisions. ► **Maintain the synchrony** between your attached databases and their corresponding SQL DB ENVIRONMENTS. ■

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## WORKSTATION

be used with a variety of 2D and 3D graphics accelerators.

The C-class workstations use the PA-7200 processor. Both the C100 and C110 have two EISA/GSC expansion slots and a single a GSC slot.

## GRAPHICS — THE GLAMOROUS COMPONENT

NEXT TO THE workstation itself, the component that gets the most attention is graphics. This is for two reasons: first, because there are so many advancements taking place in this area, and second, because this is a tangible component that you can actually see in action with impressive results unlike a SPECfp which is indeed important, but sometimes hard to relate to. I will summarize the many graphics related products, describing whether they are for GUI, 2D, 3D, etc., in the following list. In general, I am working my way up from very good 2D and good 3D performance to superior 2D and 3D performance with the high-end products:

**PowerShade Software** — Having software to accelerate graphics always throws people. The fast speed of HP processors can be used to not only speed up the program that you're running but also speed up graphics. PowerShade enables interactive 3D surface rendering on any HP color workstation. You can perform advanced lighting, shading, hidden surface removal and other advanced features.

**Color/Integrated Color** — This is base graphics capability which includes graphical user interface (GUI) and 2D application accelerator.

**HCRX-8 Color** — This is a GUI and 2D/3D vector graphics accelerator. The double buffering employed with this product provides smooth rotations for 3D wireframe models.

**HCRX-24 Color** — This is a true color imaging and 2D visualization accelerator. Used with PowerShade, you'll see true color surface rendering for solids modeling.

**HCRX-8Z Color** — Fast 3D accelerator for 3D visualization and simple component design work. A Z-buffer and 3D solids accelerator are added to the HCRX-8.

## HP Workstation Family

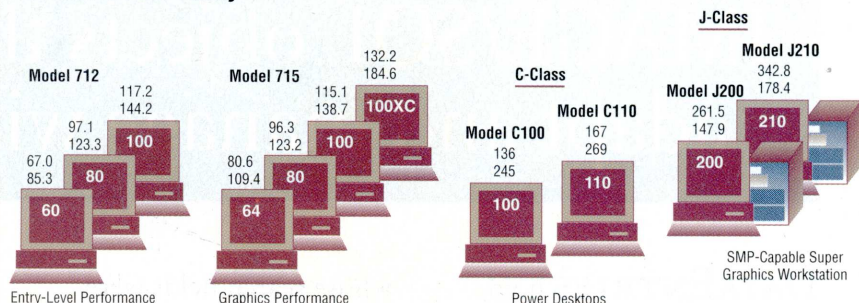


Figure 1: HP's Workstation family and system performances (SPECint92/SPECfp92) running HP-UX 10.01.

**VISUALIZE-8** — 3D solids accelerator for complex visualization and component design work.

**VISUALIZE-24** — 3D solids accelerator with true color graphics for such applications as 3D component design, medical imaging and 3D visualization.

**VISUALIZE-48** — The fastest 3D solids accelerator for complex component design, scientific visualization, simulation and other high-end graphics applications. You will see smooth rotation and animation of images with VISUALIZE-48.

**Freedom Series** — Welcome to virtual reality. The Freedom Series from Evans and Sutherland is ideally suited for visual analysis, industrial design, simulation and other applications requiring

texture maps with many small polygons. This is the fastest OpenGL display list graphics performance.

## HP X STATION FAMILY

X STATIONS are everywhere. Everyone I work with in the HP installed base has at least a couple of X Stations, some as many as several thousand, because of the unique void they fill. An X Station is similar to a workstation in that it has the same graphics display, keyboard, mouse, network connection and user interface. The difference is that an X Station has an "X Processing Unit" instead of a system processing unit. What this means is that programs run on a workstation some-

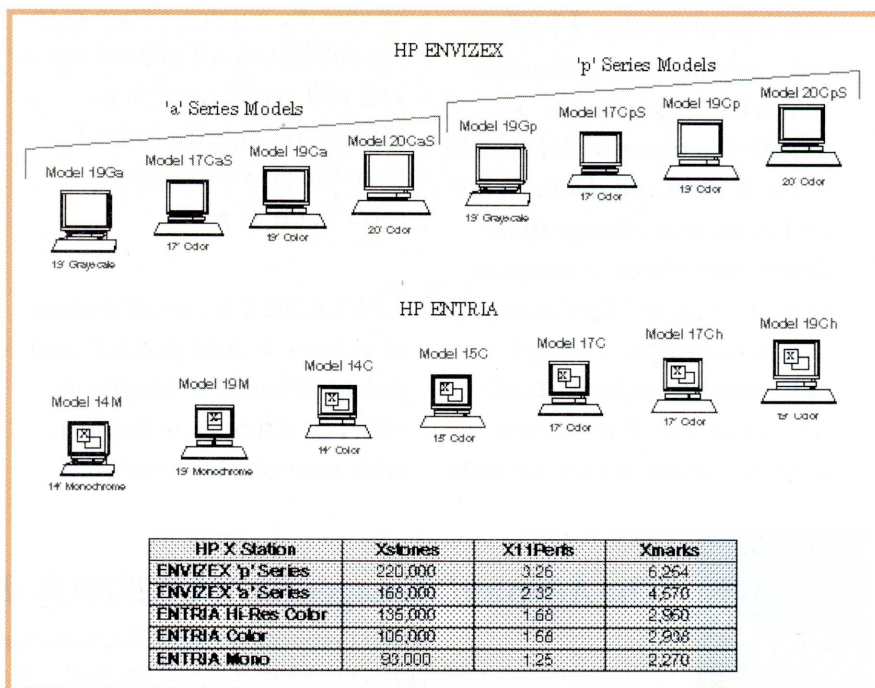


Figure 2: HP's ENVIZEX and ENTRIA X Station product lines.



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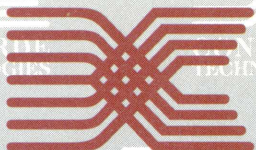
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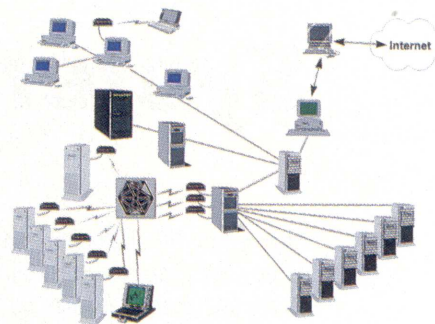
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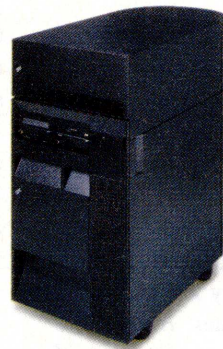
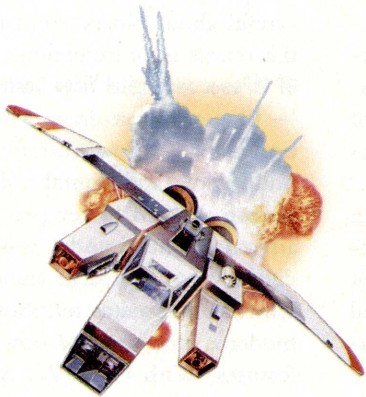
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## WORKSTATION

place on the network but all of the X processing is done locally on the X Station. This is great if you wish to manage fewer workstations because an X Station requires virtually no system management.

HP has two X Station product lines — ENVIZEX for high performance and ENTRIA for entry level. *Figure 2* shows both product lines. Although I wanted to use a minimum amount of performance benchmarks in this article, I couldn't avoid using SPECint and SPECfp numbers when describing the workstations, but stayed away from graphic performance numbers altogether. There are three key performance benchmarks related to X Windows that are widely used. These are Xstones (speed of GUI for interactive operations), X11perfs (aggregate result of 200 benchmarks) and Xmarks (focuses on network and CPU performance of X Station). Xstones is the only industry standard of these three. *Figure 2* includes these benchmark numbers for ENVIZEX and ENTRIA because when you evaluate X Stations you will have to consider these numbers.

### HP-UX 10

YOU DON'T HAVE to travel very far in the HP user community before you start talking about HP-UX 10.x these days. After completing work in this

area, including upgrading many systems from HP-UX 9.x to 10.x and writing a system administration book for HP-UX 10.x, there is only good news to report as far as HP-UX 10.x is concerned and I'll relate some of the more important aspects of HP-UX 10.x as it relates to workstations. (For an overall detailed view of HP-UX V10., see "V Minus 10," "The Ten Commandments" and "That Was 10, This Is Now," which appeared in the March, July and November issues, respectively.) The 10.01 release of HP-UX is the General Business Release which can be confidently used in a production environment. So although my list is not comprehensive, it will provide you some of the more important workstation features of HP-UX 10.x:

**Desktop/UX and Runtime/UX** — You can now select from the full HP-UX environment (Desktop/UX) or a somewhat scaled down version which is intended for systems running commercial applications. Runtime/UX includes the basic HP-UX command set, full X Windows, HP VUE and networking, and consumes less disk space. Runtime/UX is a superset of Desktop/UX and includes such functionality as the Starbase runtime environment, manual pages and network installation.

**Standards** — HP-UX 10.x conforms to many standards. One of the most important is SRV4 file system layout. This means that the directories have been somewhat restructured to conform to this de facto standard. The underlying file system has not changed, only the file system layout. Another is the OSF DCE client which comes bundled with HP-UX 10. (see "DCE 101" which appeared in the September issue). HP Software Distributor is a standards-based technique for packaging and distributing software. This will help in distributing software in the same format in

heterogenous environments.

**HP VUE and CDE** — You are probably already familiar with HP's Visual User Environment (HP VUE). The Common Desktop Environment (CDE) and HP VUE are now both bundled with HP-UX 10. CDE will run on other platforms as well as HP, so it may behoove you to investigate CDE if you have a heterogeneous workstation environment.

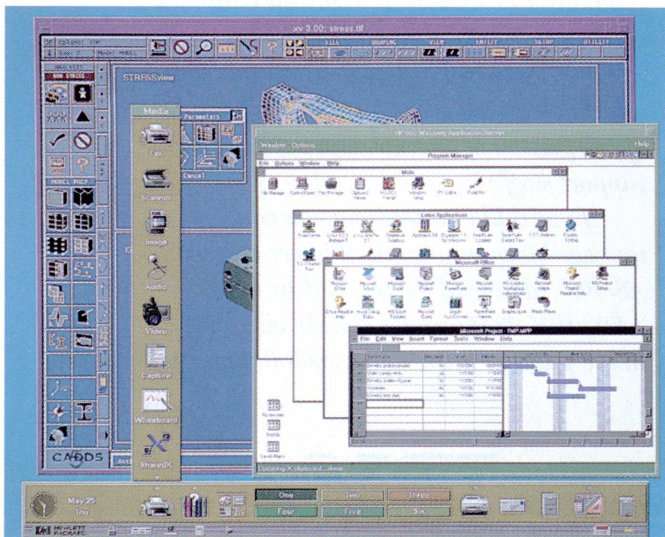
**HP-UX 9.x and 10.x Binary Compatibility** — HP-UX 9.x and HP-UX 10.x are binary compatible. HP has always been very careful about binary compatibility and this release is no exception.

### HP MPower and Digital Video Conferencing (DVC)

— One area that draws a lot of attention in the HP workstation world is multimedia and digital video conferencing. HP MPower provides many advanced multimedia tools such as: digital video playback; audio; teleshare which incorporates telephone, fax and modem; imaging; and other advanced features. With HP DVC, you get the power of live video sessions to the desktop across LANs and WANs.

### MIXING PCs AND WORKSTATIONS

I HAVE COVERED a variety of PC emulation products in *HP Professional* articles over the years. Some of these solutions are good under one set of circumstances and other solutions are good under a different set of circumstances. In general, what we have been doing is running software on an HP-UX workstation that emulates Microsoft Windows. These solutions are perfectly good under the right set of circumstances, but in general do not run Windows as well as a PC. Most workstation users like to exploit the immense power of their workstations, not run software on them which makes them look like a PC. Why not integrate into the workstation network a Pentium-based system to run Windows, thereby relieving workstations of the burden of running emulation software and giving users better performance? HP did just this with the HP 500 Windows Application Server (WAS). Here is a



*Figure 3: HP VUE with an HP-UX design application and Microsoft Windows display.*



description of the HP 500 WAS product as well as emulation products:

**HP 500 WAS** — This is a dedicated Pentium-based server that runs PC applications and displays them in X Windows to your workstations and X stations. Figure 3 shows a workstation running HP VUE with an HP-UX design application and Microsoft Windows displayed. You can cut, copy and paste between HP-UX and PC applications on the same screen.

**HP WABI** — HP WABI version 2.0 runs 24 Microsoft Windows applications on your HP workstation or X Station. Microsoft Windows API calls are translated into X Windows calls.

**Insignia SoftWindows** — The Intel instruction set is emulated by SoftWindows so some PC software runs on your HP workstation or X Station.

**Macintosh Emulation Software (MAE)** — Why stop at Microsoft Windows? Mac users are people, too. MAE runs popular Mac applications and provides a Mac look-and-feel to your HP workstation or X Station.

## A LOT GOING ON

EVERY AREA OF the workstation marketplace is advancing. This update focuses on the most important recent advancements, but you can be sure in the very near future there will be yet more advancements to digest. A lot has taken place over the last few months in the areas of HP-UX and graphics, and over the next several months you can expect many more advancements in the hardware and multimedia area. In any event, a lot will take place between this and the next workstation update.—*Marty Poniatowski is a technical consultant in computer-aided engineering for Hewlett-Packard in Stamford, Conn. He is author of "The HP-UX System Administrator's 'HOW TO' Book" (ISBN 0-13-099821-4) published by Prentice Hall PTR and distributed by CBM Books, a division of Cardinal Business Media, Inc. For ordering information, contact CBM Books at (800) 285-1700.*

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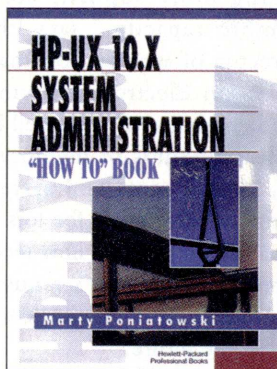
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# A Lifetime Of Memory

Deborah Schwartz

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## New Memory

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## Technologies

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## Provide Users With

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## What They Want

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## And Need

It's the consensus among computer users everywhere. You definitely need it and you can't have enough of it. What is everyone searching for? Memory. A year ago, users were using operating systems with a standard memory configuration of between 16 MB and 64 MB, with an average of 48 MB. With the release and implementation of HP-UX 10 and the subsequent increase in demand from applications and systems, standard memory require-

ments have risen to well over 64 MB. "Across HP platforms — just as with Sun and Silicon Graphics — operating systems, as well as application software, are becoming more sophisticated, requiring more capacity," says Phil Carens, director of workstation marketing at Centon Electronics (Irvine, Calif.). "And capability is enhanced by having greater amounts of memory." Therefore, IS managers and system administrators are clamoring for lots of memory and fast. And, some new technologies are allowing today's requests to become realities, while letting companies plan for the future.

There are several factors, such as availability and function, which influence the demand for workstation memory. In the late 1980s and early 1990s, there was a major shortage of memory chips. So fabrication facilities (fabs) increased their production, but demand stabilized because the memory that came standard with the systems was sufficient. This caused the price of memory chips to drop, though not dramatically. Recently, however, there has been a major shortage in the amount of DRAM available to memory vendors. According to Alexx Wood, marketing and communications director at Simple Technology Inc. (Santa Ana, Calif.), DRAM manufacturers allocate product

to the systems manufacturers and then to the memory manufacturers. Only a set amount of DRAM can be produced each year, yet demand continues to increase. But Wood predicts the memory supply and demand levels will start to even out soon — the demand for memory increased at a rate of 62 percent in 1995 but is only expected to increase 27 percent in 1996, and 80 new fab plants are expected to open worldwide in the next year. Carens concurs, "[Memory chip] manufacturers have been cautious not to repeat the cycle and get caught in a state of massive oversupply. But new fabs are being constructed as suppliers see that the memory market will continue to be strong and that demand for memory will continue."

In terms of function, you must examine the role that workstations are playing in today's computing environment. According to Carens, the use of workstations for running high-performance 3D software and the manipulation of objects in real-time, has prompted some to add upward of 1 GB of memory. "The data being used, manipulated and transferred is much more graphically based, with larger datasets," says Carens. "As a user, you're only concerned with getting data quickly and without data error —



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The v6.0 releases of JobRescue and ElectroPage are complete rewrites with many new enhancements. These enhancements include a new \$STDLIST/report viewer for MPE/iX with a much improved "foldering" strategy. This new strategy provides many new features, including easier-to-view reports, direct access to reports, and report download to PC capability.

Other enhancements include an event-driven background processor which results in more efficient resource use and more transparent operation. A menu-driven utility for both products replaces the OPTIONS file, making large editor files a thing of the past. The merge process has been eliminated, as files are aged in place and logically grouped for reporting purposes. This simplifies the file structure, history and processing.

Reports and \$STDLISTs may now be reliably archived using standard MPE utilities, such as Store/Restore, making retrieval simple. A new text indexing configuration allows you to access information very quickly, with no limit on the number of indexes defined. A new, standardized version control system—the What program—easily gives you version identification and build date/time. A new AutoDial program incorporates advanced error checking dialing capabilities for easier setup and full backward capability. The status program show and search functions have been enhanced to allow range searches.

The new, v2.0 release of TranSpooler also offers new enhancements for print distribution including more powerful UNIX compatibility. Also new is a user-friendly graphical interface for easy installation and configuration. TranSpooler provides direct printing from MPE/iX to JetDirect printers via TCP/IP to maximize system resources, as well as support for industry-standard protocols such as LPR/LPD and TFTP. Also new is a single threading feature that, when enabled, ensures original print order is maintained. TranSpooler now runs on HP3000 MPE/iX, HP-UX, SCO, AIX and Solaris.

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# MEMORY

## Third-Party Memory Vendors

This table shows a sampling of what's available in the third-party HP workstation memory market.

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<b>Andataco Computer Peripherals</b> 10140 Mesa Rim Rd. San Diego, CA 92121 (619) 453-9191 CIRCLE 343 ON READER CARD	•	•	•	•	•	•	•	•	•	•	•	\$559-\$3,635 \$559-\$3,635 call for pricing call for pricing call for pricing
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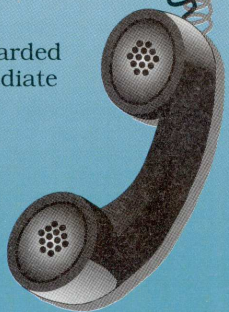
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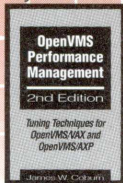
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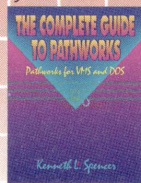
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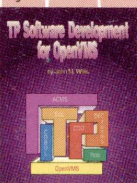
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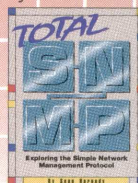
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## MEMORY

the ability to transparently use the system and the data." Carens also points out that there is less and less of a distinction between high-end Intel-based desktop PCs and low-end RISC-based workstations. "With Intel's domination of the PC market and the HP-Intel alliance that will produce a next-generation processor chip, which will most likely be used in both *PCs and workstations*, these two worlds are colliding," says Carens. "Workstations are a traditional area for memory, but that market is changing." Carens predicts that "Eventually, you will have a box on top

of your TV that has the functional ability of today's workstations. And these home entertainment systems will require a huge amount of memory."

### DRAM IT

IN ORDER TO KEEP up with the changes in operating systems, applications and CPU memory requirements, DRAM technology has evolved. About one year ago, most DRAM products used a 4 Mbit (Mb)-based chip. Today, the chips are based on 16

Mb technology. This means a four fold increase in capacity on the chip. In other words, the chip has a greater density while occupying the same footprint. Before, users could easily fill up the available slots with 4 Mb memory, but this didn't leave any room for adding additional memory in the future. With 16 Mb memory chips, you can get the same capacity with fewer slots. The slots that are left open are then available for future growth.

Dan Carson, memory product manager at Dataram (Princeton, N.J.), predicts that within the next nine to 18 months, 64 Mb-based chips will be the standard. "Right now the technology is there," says Carson. "But no

## Third-Party Memory Vendors

continued from previous page

Company	Platforms Supported					Capacity (MB)						Price **
	712	715	C-Class	J-Class	K-Class	4	8	16	32	64	128	
<b>Kingston Technology Corp.</b> 17600 Newhope St. Fountain Valley, CA 92708 (714) 438-1850 CIRCLE 330 ON READER CARD	•						•	•	•	•		\$480-\$3,300
		•					•	•	•	•		\$480-\$3,300
			•	•					•		•	planned
					•				•		•	\$1,840-\$6,685
<b>Legasys International</b> 1006 Depot Hill Rd. Broomfield, CO 80020 (303) 469-6114 CIRCLE 329 ON READER CARD	•						•	•	•	•		\$345-\$2,445
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<b>Newport Digital</b> 14731 Franklin Ave., #A Tustin, CA 92680 (714) 730-3644 CIRCLE 313 ON READER CARD	•						•	•	•	•		\$420-\$2,300
		•					•	•	•	•		\$420-\$2,300
			•						•		•	\$1,200-\$4,900
				•					•		•	\$1,200-\$4,900
<b>PNY Electronics Inc.</b> 200 Anderson Ave. Moonachie, NJ 07074 (201) 438-6300 CIRCLE 312 ON READER CARD	•						•	•	•	•		call for pricing
		•					•	•	•	•		call for pricing
				•					•		•	call for pricing
					•				•		•	call for pricing
<b>Simple Technology Inc.</b> 3001 Daimler St. Santa Ana, CA 92705 (714) 476-1180 CIRCLE 311 ON READER CARD	•						•	•	•	•		\$420-\$2,805
		•					•	•	•	•		\$420-\$2,805
<b>Texas ISA Inc.</b> 14825 St. Mary's Ln., Ste. 250 Houston, TX 77079 (713) 493-9925 CIRCLE 309 ON READER CARD	•							•	•	•		\$1,000-\$2,000
		•						•				\$600
<b>Viking Components</b> 11 Columbia Laguna Hills, CA 92656 (714) 643-7255 CIRCLE 327 ON READER CARD	•						•	•	•	•		\$477-\$3,385
		•					•	•	•	•		\$477-\$3,385
<b>Vanguard Technology</b> 11211 E. Arapahoe Rd. Ste. 200 Englewood, CO 80112 (303) 790-6090 CIRCLE 450 ON READER CARD	•						•	•	•	•	•	\$559-\$7,191
		•					•	•	•	•	•	\$559-\$7,191
				•					•		•	\$2,060-\$7,195
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		•						•	•	•		call for pricing
												96 MB upgrade
												also available

\*\*Prices are suggested list price (without discounts) as of 10/95.



[64 Mb] products are available because there isn't any product demand."

According to Paul Popadak, design engineering manager at Kingston Technology Corp. (Fountain Valley, Calif.), 64 Mb technology also is impacted by the interwoven issues of available board space and cost. "It's still cheaper to use four

16 Mb boards,"

Popadak says. "If you have the space,

you're going to go with the cheaper solution. If you have

space limitations, you'll

pay the high-

er price." For example, HP's new C-class workstations use 4Mb and 16Mb

ECC (60 ns)

DRAM. An HP

32 MB (4 Mb)

memory module

(\$2,080) uses two

of the eight SIMM slots available. On the other hand, a higher density HP 128 MB (16 Mb) memory module (\$8,320) also uses only two slots.

The HP 9000 workstation product line also includes the 712, 715 and J-Class systems. Additionally, the K-Class systems, marketed by HP as a technical server, can be included as well. At the low-end, third-parties are providing memory upgrade kits for the HP 9000/712 and HP 9000/715 in 4, 8, 16, 32, 64 and 128 MB kits. At the high-end, upgrades are available in 32, 64 and 128 MB kits for the J and K classes. And, the recent announcement of the C-Class workstations has brought a flurry of new memory products to market that are similar in capacity and price to the J- and K-Class chips. The table ON PAGE 32 shows a sample of third-party HP workstation memory vendors. Note: While the table only lists the platforms considered to be part of the current HP workstation line, most of the vendors listed also provide memory upgrades for previous HP systems as well.

In the next generation of memory chips, which will begin to appear in approximately 18 months, we'll see 256 MB, 512 MB and 1 GB upgrades for the high-end systems. However, these new,

higher capacity chips might cause problems for some older systems. "These newer technologies are more directed toward the newer systems," Carson says. "For the C, J and K, sure. But the 712 and 715 architectures won't support these incremental increases." Kingston's Popadak agrees, "Vendors

**With 16 Mb memory chips,  
you can get the same capacity  
with fewer slots. The slots  
that are left open are then  
available for future growth.**

are trying to stay clear of locking into certain designs, but there have been limitations where older designs won't support new technology." For example, 64 Mb chips are designed for lower power 3.3V systems while most workstations currently use 5V.

Also in the next year, users can expect to see new types of DRAM chips on the market such as Extended Data Output (EDO) and Synchronized DRAM. Simple Technology Inc. and PNY Electronics Inc. (Moonachie, N.J.) are two companies currently providing EDO solutions despite EDO chip shortages. Simple's Simple EDO uses standard DRAM technology with a custom ASIC that provides EDO emulation. This results in an EDO memory module that operates with equivalent efficiency to a standard EDO module, but is not restricted to EDO chip shortages. Simple EDO is available in 4, 8, 16 and 32 MB capacities. PNY supports the Burst EDO DRAM standard with 1, 2, 4 and 8 MB (up to 32 MB) SIMMs/SO DIMMs, and 1, 2 and 4 MB (up to 64 or 72 MB) DIMMs.

Synchronized DRAM has a slightly different interface, but produces quicker access speeds. Popadak predicts Synchronized DRAM products will be readily available in the beginning of

1996 from companies such as Samsung (Ridgefield Park, N.J.) and Toshiba (Houston, Texas).

## DECISIONS, DECISIONS

ALTHOUGH NOT necessarily the top priority when purchasing memory, price is a definite factor. According to Dataram's Carson, memory pricing is

dynamic. "Month to month, prices

can change depending on market conditions," Carson says. Important factors include: the

amount of DRAM

available, the type of

DRAM mix and the

growth of specific seg-

ments for DRAM usage. Because

DRAM prices do fluctuate daily, it is

important to note that prices listed in

the table are the suggested list price

(without discounts) as of November

1995.

"Customers are looking for memory companies with expertise and the ability to help them upgrade their memory with a high quality product — not just today, but two years and five years from now," Carson says. "Then they look at price and whether the product is immediately available." Centon's Carens agrees. "Customers are defining value based on several criteria. Some view price as number one. Others see the issue as more complex," Carens says. "A customer might have four, five or six manufacturers providing solutions all within shooting price of one another. It's important for the customer to do business with the vendor with whom they have the highest confidence level."

Regardless of the type of system you administer or the applications you must run, the following updated Benjamin Franklin adage is true, "... in this world, nothing can be said to be certain, except death and taxes" and the need for more memory.

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# Do Too Many APIs Spoil The Port?

**Now that Microsoft has introduced two new follow-on operating systems to Windows 3.1 — Windows**

Windows NT and Windows 95 — you may find yourself faced with having to choose between developing code for the large installed base of Windows 3.1 users and writing code for the small but rapidly growing market for full 32-bit Windows applications.

You can simply use a 16-bit version of your code, written for Windows 3.1, and hope that your software testing will reveal any compatibility problems before your customers do. That is, if you don't mind running 16-bit applications under Windows 95 and Windows NT. That method, however, is not very satisfying because it doesn't take advantage of the full 32-bit power available in Microsoft's newer OSes. And it prevents your customers and users from enjoying all the performance they can get on their high-performance systems including 386, 486 and Pentium-based PCs.

Another solution is to write two versions of your code — one for Windows 3.1, and another one for Windows 95 and Windows NT. However, while this provides your users with the benefits they want, your development organization will be bur-

dened with two unique and possibly incompatible code streams.

## WIN32S TO THE RESCUE

The last option is the only acceptable solution: write your 16-bit application using the Win32s API which is available and fully supported by Microsoft. Win32s is a subset of the Win32 API for Windows NT and Windows 95 that is designed to be used on systems running Windows 3.1 or Windows for Workgroups. In other words, the Win32s API is an emulation environment that you use on Windows 3.1 (16-bit) that lets you run/execute programs compiled on Win32 (32-bit).

Under Windows 3.1, the Win32s subsystem is a collection of dynamic link libraries (DLLs) and virtual device drivers (VxDs) that provide you with the full 32-bit compiled applications on almost any system running the older 16-bit version of Windows. This means a developer can write a single code stream; offer compatibility and full 32-bit power on newer operating systems with full backward compatibility to Windows 3.1x; and let your users experience the full 32-bit power of the newer operating systems.

VxDs, introduced with Windows for Workgroups 3.1, are to Windows what terminate-and-stay-resident (TSR) programs were to MS-DOS. In essence, VxDs are extensions to the Windows environment that can be added at almost any time. In the case of the Win32s VxD, it intercepts any exception conditions generated by



## Microsoft Visual C++ 2.0 and versions of Mosaic require the Win32s subsystem to use their applications under Windows 3.1.

Windows 3.1 as a result of a program call. If the API call is rejected by Windows running in 16-bit mode, the VxD receives the call. If the call in question is not a Win32 call, the VxD rejects the call and Windows 3.1 reports the failure, probably with the familiar GPF failure.

If the call that generated the exception is a valid Win32 call, the VxD maps the call through the Win32s DLLs. If the call is one that can be performed under 16-bit Windows, the Win32s subsystem performs the call. If it is not a call that can be completed

under Windows 3.1 — a request to start a new thread as described below — the Win32s returns a “failure” condition that your application can then handle.

### HOW TO GET WIN32S

A number of applications, including Microsoft Visual C++ 2.0 and the NCSA and Netscape versions of Mosaic, already require the Win32s subsystem to use their applications under Windows 3.1. Typically, these applications install Win32s as part of their installation process. However, if you want to install

the Win32s subsystem on your system, or if you want to ship a copy of the Win32s subsystem with your applications so users can execute your 32-bit code on Windows 3.1, you can obtain the newest version of Win32s from the Microsoft ftp site at <ftp.microsoft.com> or from the Microsoft Developer's Forum on CompuServe as well as America Online.

When you receive the file, follow the instructions in the accompanying README.TXT. Generally, you want to use the **pkunzip** utility with the **-d** flag to unzip the Win32s API into the original directory structure.

```
pkunzip -d w32s120.zip
```

When the file is finished unzipping, you will find a setup program which will install the Win32s subsystem.

Once installed, the various DLLs and the VxD file implement a Windows 3.1 compatible subset of the Win32 API that is part of Windows NT and Windows 95. This allows the

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user to execute the same executable on all versions of Microsoft Windows, both 16-bit and 32-bit, with the best possible performance.

The APIs in Windows 3.1 and Windows NT share a large common set of features. The Windows 3.1 kernel is responsible for all graphics and windowing operations, but any unknown calls are routed through a "mapping layer" that allows Win32-based applications to make 32-bit calls to Windows 3.1.

#### DEVELOPING COMPATIBLE CODE

You start by writing code for the Win32 SDK on Windows NT. When the application has been written and tested, you should install the Win32-based application and the Win32s package on Windows 3.1. If you have followed the guidelines provided by Microsoft, your 32-bit code should now be running fine on Windows 3.1, albeit with a potentially reduced feature set as described below.

Not all of the features of the full 32-

bit API are functional under existing Windows 3.1. For example, Windows 3.1 doesn't support multithreaded processes, or pre-emptive multitasking. If a 32-bit application running under Win32s on Windows 3.1 encounters a **CreateThread()** call, the Win32s VxD intercepts the call and returns a **null** value, indicating that a new thread could not be created. In this way, your code can check the success of a 32-bit API call to determine if the call was successful.

Win32s, in addition to providing the full Windows 3.1 features, supports a number of Win32 calls including full OLE 2 support, localized language support (NLS), combined libraries, and 32-bit Windows sockets for higher network performance. Win32s provides much of the higher performance of 32-bit applications even for applications running on 16-bit Windows. Win32s also includes a "thunking layer" which handles the potential incompatibilities between 16-bit and 32-bit code. The most graceful

way to handle this 16-to-32-bit interface is via an RPC, shared memory or the clipboard, but the Win32s API attempts to resolve the differences.

Some of the capabilities that function only on Windows NT and Windows 95 include access to virtual memory, memory-mapped files and full multithreading. Win32 doesn't support direct access to hardware or to the BIOS, so the Win32s subsystem makes these calls through various Win32 emulation routines. Microsoft has provided a good way for developers to create a single code base using Win32, and then execute this 32-bit code on 16-bit systems. If you write code for internal use or for resale, Win32s might give you that ever elusive backward compatibility until 32-bit Windows platforms become pervasive.

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### Bristol Technology Inc. Announces HyperHelp 5.0

Bristol Technology Inc. announced HyperHelp version 5.0, its software for creating UNIX-based, online help systems with WinHelp functionality. Release 5.0 is the X Window/Motif equivalent of the newly-released Windows 95 WinHelp 4.0.

HyperHelp enables developers to add context sensitive, hypertext-based online help to UNIX applications. It supports the same Rich Text Format (RTF) files, project files and bitmap files as Windows 3.1, Windows NT and Windows 95 Help. It also supports text authoring tools, such as Microsoft Word, WordPerfect, Lotus Word Pro, Interleaf, Frame Maker and Standard Generalized Markup Language (SGML) and ASCII text editors.

Other additions include: a "training cards" feature which provides two-way communication between help and its related application, authorable and depressable buttons, a context-sensitive right mouse button pop-up menu, a display zoom feature, the ability to select text in the main window to copy and paste into the user's application, powerful secondary windows features, and new macros and APIs to make help systems more interactive and automated.

HyperHelp is available on HP 9000 Series 700/800 HP-UX 9.x, SunOS and Solaris 2.x, IBM RS/6000 AIX, SGI Irix 5, DEC Alpha (Digital UNIX and OpenVMS), DEC VAX (OpenVMS), SCO ODT, Solaris for Intel (x86) and UnixWare x86. Price is \$5,000.

Contact Bristol Technology Inc., 241 Ethan Allen Hwy., Ridgefield, CT 06877; (203) 438-6969.

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### OSM Inc. Releases COS/Report And COS/Print

Open Systems Management Inc. (OSM) announced their COS/Print print spooling software and COS/Report report management software.

COS/Print is a mainframe-quality print spooler with true network awareness so that a system manager can control print spooling on a network basis. It allows for printing to devices connected to any system on the network whether connected directly to a host, via a terminal server or

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Contact OSM, 111 Third Ave., Ste. 2500, Seattle, WA 98101; (206) 583-8373.

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### **GrayMatter Software Provides ScriptServer NQM V2.5.3**

GrayMatter Software announced version

2.5.3 of ScriptServer NQM software. Designed to centralize management of mixed CPU printing networks, ScriptServer NQM software version 2.5.3 provides a client-server-broker architecture compatible with a wide range of operating systems.

From one central UNIX CPU, it supports printers and clients on a variety of CPUs running HP-UX, SunOS, Solaris, Digital UNIX (OSF/1), OpenVMS and Windows 3.1. System administrators can use the OSF/Motif GUI to configure and manage the system, from setting up automated printing and transparent solutions to complicated problems. Priced by operating system and per queue, ScriptServer NQM software costs begin at \$2,990 for a single server.

Contact GrayMatter Software Corp., 2825 Eastlake Ave. E., Ste. 210, Seattle, WA 98102; (206) 329-8800.

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### **PSG Introduces Facade 1.0**

Performance Software Group (PSG) released the Facade CoEditor Version 1.0, a text editing system with the look, feel, power and responsiveness of PC-based editors without the constant uploads and downloads. Features include concurrent editing of multiple files; multiple windows into any files; full point-and-click mouse support; cursor positioning for text entry or selection; cut and paste words, lines and even rectangular areas; unlimited undo and redo; drag copy or drag move; display and edit of embedded control characters; tab stops and smart tabbing; automatic block indent and outdent; selectable font and size; color margin and guide lines; automatic periodic file save; online help; and numerous custom programming environment options.

Pricing starts at \$950 permitting one connected PC with subsequent declining incremental costs (\$350 per PC with a 50 PC license).

Contact PSG, 11260 Roger Bacon Dr., Ste. 500, Reston, VA 22090; (703) 471-0168

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### **HARDWARE**

### **Todd Enterprises Unveils CDR-EXPRESS Duplicator**

Todd Enterprises announces the availability of CDR-EXPRESS, a completely integrated hardware and software system for duplicating recordable compact disks.

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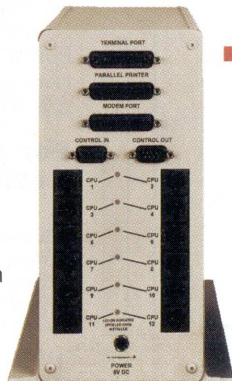
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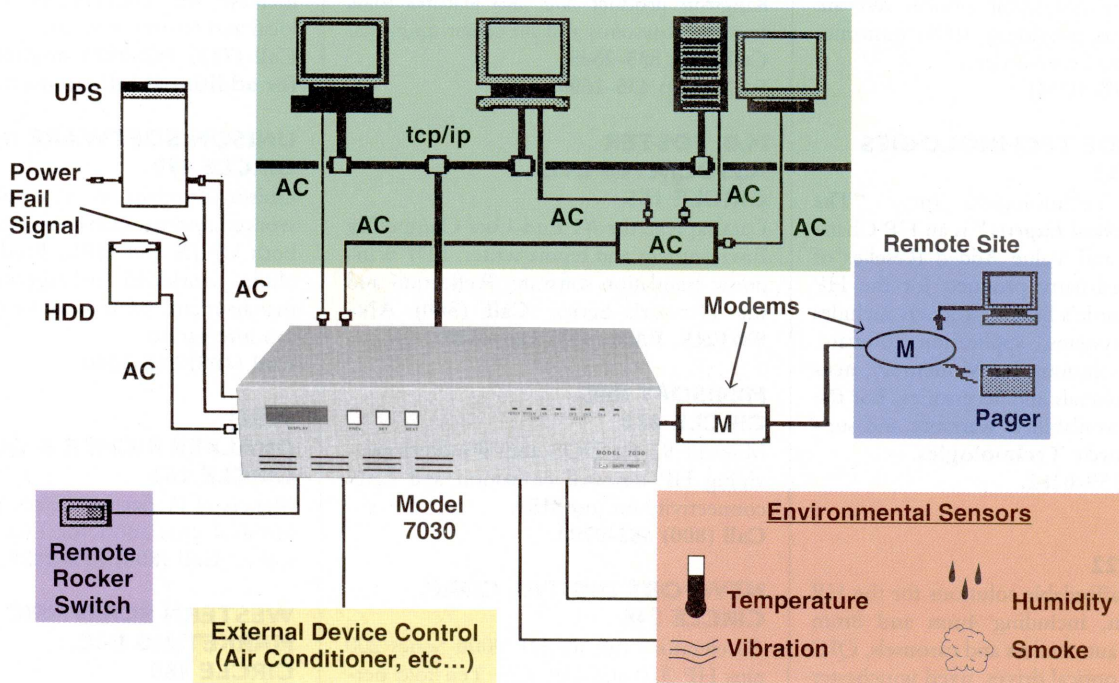
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### HP, Gemplus, Informix Deliver Personal Information Cards

HP, Gemplus and Informix announced the formation of an alliance to develop a secure infrastructure that will enable corporations to speed new services to customers via a credit-card-sized personal information card.

The cards will carry several thousand times the amount of data carried by currently available smart cards. Additionally, the data on these cards will be fully encrypted for secure international communication, so the card will be able to be used anywhere in the world.

The personal information cards, along with international cryptography, will allow companies to have: secure communications between employees of a multinational corporation; secure transactions on the Internet; secure international transactions between credit-card and service providers; and secure personal information that also is managed by the owner.

### MountainGate Announces Chaparral Line

MountainGate introduced the formation of a new archival storage product line based on recently acquired Metrum Peripheral Products, the Chaparral product line. The new archival storage products will include DLT, optical disk and VHS tape storage libraries.

The Chaparral product line will continue to offer a range of archival solutions. The DLT libraries include Chaparral D-28 (a 28 cartridge deskside library with capacities up to 560 GB); Chaparral D-60 (a 60 cartridge library with up to 1.2 TB capacity); Chaparral D-360 (an expandable library with up to eight DLT drives and up to 360 cartridges for a total capacity of 7.2 TB); Chaparral D-480 (a 480 cartridge expansion library with up to two DLT drives which can be connected

to the D-360); and the Chaparral D-900 (a standalone automated data library with up to 20 DLT drives and a storage capacity of up to 18 TB).

The Optical disk library includes the Chaparral O-626, a library utilizing up to 626 5.25-inch magneto optical disk cartridges to provide up to 814 GB of storage. The VHS library series includes the Chaparral RSP-2150, a tape drive subsystem; the Chaparral V-48, a 48 tape cartridge capacity library which includes

two RSP-2150 tape drives for 1.0 TB of capacity; and the Chaparral V-600, a tape cartridge capacity library which can include up to six RSP-2150 tape drives.

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In these times of commodity hardware prices, customers have gotten accustomed to referring to HP systems as "boxes." As an HP-focused system integrator, that hurts. But I guess I have to get used to it. At August's Interex '95 in Toronto, Carol Mills, general manager for HP's General Systems Division, commented that if HP made cars, a Lexus that cost \$40,000 seven years ago would cost \$2 today and go 700 miles per hour! The same changes which have turned systems into boxes is making us all rethink our roles, our careers, our focus and our ways of working.

But more importantly, it's forcing *you* to redefine *your role* within your organizations. For example, because of a lack of staff and corporate resources, we constantly hear about MIS Band-Aids instead of solutions. Then there are the stories of MIS managers being fired for failure to bring new technologies to the table. Well, the executives have been busy reading the business section of the paper while you've been studying techie magazines.

In other words, you really need to be a manager, not a techie. You need to involve yourself in your organization's business. You need to be a facilitator of technology: Someone who can establish partnerships with outside suppliers and develop a network of key providers that can work with you and your team to solve problems by applying the appropriate technology.

You need to be on the *value side* of your business — *not the cost side*. You need to be perceived as a valuable resource, an internal consultant that can help your organization do what it does better, serve customers better, make products better and differentiate itself better than your competitors.

Whether it's been spoken or not — FIND A WAY — that's the mandate. You can start by doing a pilot project in client-server.

Take something on your HP 3000 and re-do the front end in Microsoft Access or Visual Basic. It doesn't have to be a working system. Do it on your own time. Show it to your users. Get them excited. Talk about what technology means in the processes they struggle with every day. In MIS, change has always been a constant. Now, however, the rate and degree of change are different. There has been a break with the past that requires a leap into the future.

Don't ask what can we do and what can we accomplish? But what do we have to do? And when can we accomplish it? The answers require that you give up some degree of control. But once you do, you're empowering yourself with the freedom to solve your problems in new ways.

So as someone who makes a living implementing "boxes," why am I urging *HP Professional* readers to "break out of the box"? Because the market has created a niche for the integrator who can "break out the box." In other words, we have to follow our own advice. Within the HP community, integrators need to provide best-in-class products and form relationships with other service providers. We build relationships and we nurture those relationships to create an atmosphere in which our customers have more freedom to focus on solutions.

You can lament or you can change. HP has already been re-thinking how they sell, how they provide service and how they maintain a relationship with their customers. So, in turn, should you. —Paul Sita is the president of Perfect Software Solutions Inc. (Mineola, N.Y.), which specializes in HP systems, networking, and complementary products and technologies.





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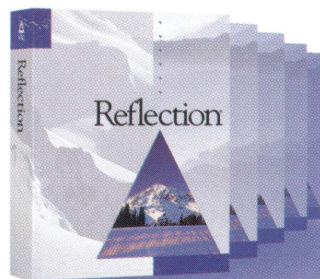


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